To: Allgeier, Steve[Allgeier.Steve@epa.gov]; Magnuson, Matthew[Magnuson.Matthew@epa.gov]
From: Hedrick, Elizabeth
Sent: Mon 2/3/2014 3:57:36 PM
Subject: RE: MCHM and Formaldehyde

FYI, just looked at description of patent process for making CHDM. It actually involves hydrogenation (reduction) of the dimethyl,1,4-cyclohexanedicarboxylate (1% of crude). So it's presence in MCHM crude may be as unreacted starting material.

Point is, there is no methanol in synthesis of MCHM or CHDM. With the other big component in Crude MCHM being the 4-methoxymethylcyclohexane methanol (4-22%) maybe look how the ether linkage fragments in MS. Since I missed the call you had last week on the TICs I don't know what the analyses were for. Is the spreadsheet Wendy shared for drinking water or river water or tank material?

Elizabeth

Process for the preparation of cyclohexanedimethanol

US 6187968 B1Abstract

This invention provides a process for preparing cyclohexanedimethanol comprising hydrogenating a cyclohexanedicarboxylic acid dialkyl ester by a fixed-bed continuous reaction in the presence of a preformed copper-containing catalyst under the conditions of reaction temperature of 200 to 280° C., hydrogen pressure of 185 to 300 kgf/cm2 and hydrogen gas feed rate of 1 to 40 cm/s in terms of superficial linear velocity, the cyclohexanedicarboxylic acid dialkyl ester being prepared, typically, by ring hydrogenating of an aromatic dicarboxylic acid dialkyl ester in the presence of a preformed supported ruthenium catalyst by a fixed-bed continuous reaction.

From: Hedrick, Elizabeth
Sent: Monday, February 03, 2014 10:29 AM
To: Allgeier, Steve; Magnuson, Matthew
Subject: RE: MCHM and Formaldehyde

Steve,

I would agree with the author that the oxidative degradation pathway of MCHM would be oxidation of the primary alcohol (attached to a carbon with 2 Hs) to an aldehyde (4-methyl cyclohexane -1-carbaldehyde, a chemical with a CAS but I cannot find information on its stability) and the next step would be oxidation of the aldehyde to a carboxylic acid.

I have read that MCHM is a byproduct of 1,4-cyclohexanedimethanol synthesis (CHDM). The other components of the crude MCHM appear to be oxidation products of MCHM or CHDM. Carboxylate (5% of crude), ether (methoxymethyl, 4-22%) and dicarboxylate (dimethyl ester, 1%).

If methanol is in the crude as stated in the Eastman MSDS, then it was likely added and not a byproduct or oxidative degradation product of MCHM.

Elizabeth

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From: Allgeier, Steve
Sent: Monday, February 03, 2014 9:24 AM
To: Hedrick, Elizabeth; Magnuson, Matthew
Subject: FW: MCHM and Formaldehyde

FYI – thought you would find this interesting. If you read it and note anything that sounds untrue, please let me know.

From: Arguto, William
Sent: Monday, February 03, 2014 8:56 AM
To: Allgeier, Steve; Gray, Wendy; binetti, victoria
Subject: MCHM and Formaldehyde

I was trying to find the article that was referenced in our conversation on Friday regarding formaldehyde. I think the link below may be it

http://pipeline.corante.com/archives/2014/01/30/the_west_virginia_formaldehyde_claim_is_nonsense.php